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1 **SURVIVAL FACTORS FOR SUBCONTRACTORS IN ECONOMIC DOWNTURNS**

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17

18

19 **ABSTRACT**

20

21 This paper analyzes key issues facing subcontractors in the context of a severe economic crisis,  
22 aiming to detect the factors that are critical for the survival of the subcontractors. While previous  
23 research efforts have analyzed factors related to subcontractor performance in regular financial  
24 conditions, there remains only sparse knowledge of how subcontractors are to survive when  
25 economic conditions become dire as they have in recent times in the Spanish construction market. In

26 this research, in-depth interviews with managers of relevant Spanish subcontracting companies  
27 were carried out, resulting in the identification of eight factors for subcontractor survival: project  
28 delivery method, demand, financial capital, relationship assets, managerial assets, human assets,  
29 legal framework, and geographic scope. The project delivery method used by the owner and also by  
30 the main contractor is mainly based on price. As a result, the subcontractors' bids get lower, making  
31 them unsustainable in the long run. Furthermore, subcontractors do not get financial support from  
32 banks easily in order to cover their additional financial costs. These facts push subcontractors to get  
33 a guarantee of payment by the main contractor, while subcontracting companies may even ask for  
34 payments in advance. Subcontractors also seek long-term relationships with the contractor. These  
35 trusting relations are very often a prerequisite to qualify and bid for contracts. Subcontractors have  
36 to continuously improve, plan ahead and adapt quickly to the new environment. Therefore,  
37 subcontractors must remain flexible and maintain a lean hierarchical organization. Doing so makes it  
38 is easier for subcontractors to compete in both their native markets, as well as abroad. To this end,  
39 the most successful subcontractors have become international during the expansion phase of the  
40 economic cycle; many of them went abroad with the help of a contractor from their home country.

41

42

43 **KEYWORDS:** Construction; Economic Crisis; Spain; Survival Factors; Subcontracting

44

45

## 46 **INTRODUCTION**

47

48 A country's economy is significantly influenced by the construction sector, not only because of the  
49 construction activities per se, but also because of the related industries that supply equipment and  
50 materials, as well as services such as engineering and architectural consultancy, operation activities,  
51 and facility management. The significance of the sector is reflected by its relative weight in the Gross

52 Domestic Product (GDP): approximately 10% for the whole European Union (FIEC 2007) and 13% for  
53 Spain in 2006 (SEOPAN 2012). However, the financial crisis of 2007 hit the construction industry  
54 heavily (Ichniowski 2012; Villegas et al. 2012). This is especially true for Spain and other Southern  
55 European countries, where the sector has seen a 75% reduction in residential building production,  
56 67% drop in public procurement, and accounts for approximately 75% of job losses in Spain, during  
57 the 2007-2011 period (SEOPAN 2012). In view of this scenario, the largest Spanish construction  
58 companies have increased their production in foreign countries (Martin and Gonzalez 2010; Villegas  
59 et al. 2012). Spanish contractors are, after the Chinese, the second most successful worldwide (9% of  
60 the total), and the first in Latin America, with a 32% share of the market (ENR 2012).

61

62 In the Spanish construction industry, the design-bid-build project delivery method accounts for 75%  
63 of public procurement, whereas the remaining 25% consists basically of concession contracts  
64 (SEOPAN 2012). There are only two types of contracts regarding payment provisions in view of the  
65 Spanish Law 03/2011 on Public Contracts: unit-price (according to a bill of quantities) and fixed-price  
66 (or lump sum); the former is the more habitual one, whereas the latter is only admissible under strict  
67 circumstances (de la Cruz et al. 2006). Even though there is no official data regarding private  
68 contracts, the design-bid-build delivery method is used most often because of the regulations  
69 imposed by Law 38/1999 on Building and the traditional *modus operandi* of the industry (Pellicer  
70 and Victory 2006); the Law 38/1999 overprotects the architect as an independent professional and  
71 deters in fact other alternative delivery methods. Lump-sum and unit price payment provisions are  
72 both equally implemented for residential buildings. Only industrial or commercial entrepreneurs use  
73 relationship-based or integrated delivery strategies (García-Monsalve 2005).

74

75 Regarding the procurement procedures, two of them are mainly used by public and private owners:  
76 (1) open bid (or low bid), where only the price is considered; and (2) a one-stage request for  
77 proposals (RFP), where the price, the technical proposal, the schedule, the quality and safety control

78 procedures, and the team experience are the factors generally considered (Pellicer and Victory  
79 2006). When using a one-stage RFP in public contracts, the price is the factor more weighted (at  
80 least 50%) because of requirements imposed by the European Union through Directive 2004/18/EC  
81 on the coordination of procedures for the award of public works, supply and service contracts.  
82 Furthermore, the two-stage RFP is rarely used by owners. However, private owners sometimes use  
83 the pre-qualified bid or sole source procurement strategies.

84

85 In this scenario, most of the time contractors are selected based on low price as the main factor of  
86 the bid. The owner's project delivery strategy forces the contractors to select subcontractors based  
87 on low price too, even though the contract between these two parties is always private from a legal  
88 standpoint. Relationships among the different stakeholders (owner, designer, main contractor, and  
89 subcontractors) are adversarial, and collaboration is not sought (de la Cruz et al. 2006). Main  
90 contractors do not perceive subcontractors as cooperators either (Kumaraswamy and Matthews  
91 2000; Mason 2010). Subcontracting in Spain is regulated by Law 3/2011 on Public Contracts and Law  
92 32/2006 on Subcontracting in Construction. These regulations allow for subcontracting up to a  
93 maximum of 60% of the total turnover of the construction project and for three tiers of  
94 subcontracting only, including the self-employed workers in the lower tier.

95

96 To a limited extent some research has been done regarding the behavior of the construction  
97 industry during recession periods; most of the contributors have developed prediction models for  
98 implementation in construction companies. Kangari (1988) analyzes the effect of macroeconomic  
99 factors on construction companies' failures comparing different ratios and proposing a model  
100 obtained from a multiple regression analysis; later on, this model is tuned up and focused on the  
101 company' financial performance (Kangari et al. 1992). A similar approach is followed by Langford et  
102 al. (1993) and Abidali and Harris (1995) using multivariate discriminant analysis, and by Hall (1994)  
103 using logit regressions instead. Arditi et al. (2000) present an alternative approach grouping the

104 causes of failure in view of the environment conditions and the company's response; they conclude  
105 that most of the failures are due to budgetary and macroeconomic reasons. Later contributions deal  
106 with the specificities of the Asian economic crisis of the late twentieth century in Hong-Kong (Chan  
107 et al. 2005) and Korea (You and Zi 2007). Lim et al. (2010) also deal with the Asian economic crisis in  
108 Singapore through a survey that provides an in-depth analysis of the survival strategies used by  
109 contractors. Finally, Jung et al. (2012) evaluate the international performance of Korean contractors  
110 over a complete cycle of expansion-contraction-expansion. These two last contributions are  
111 somehow contradictory in their main implications: whereas the former claims that main contractors  
112 should stick to its basic business, the latter proposes an international diversification strategy; both  
113 papers, however, highlight the importance of financial soundness for the survival of the firms.

114

115 The above contributions have broadened the body of knowledge on the behavior of the construction  
116 industry during economic downturns. Nevertheless, these studies are focused on the behavior and  
117 performance of the main contractors, in particular, or on the construction industry, in general.  
118 Moreover, some authors have analyzed subcontracting companies using different approaches, as it  
119 will be seen in the following section, but none of them has approached their performance in an  
120 economic crisis scenario. In this competitive market of very low demand and high supply,  
121 contractors and subcontractors have to adapt to the new environment (Villegas et al. 2012).

122

123 Therefore, the purpose of this paper is to analyze the issues facing subcontractors in this scenario of  
124 severe economic crisis, and the study aims to detect the factors that are critical for these companies  
125 to survive. The research question can be stated as follows: What are the factors facilitating the  
126 survival of subcontractors in a scenario of severe economic crisis? The research involved in-depth  
127 interviews with managers of relevant subcontracting companies; all the subcontractors are still in  
128 business and they have good reputations in the industry. In the following sections, we will discuss  
129 the relevant literature, describe the research method, and explain the results (survival factors); the

130 discussion includes references that support arguments, as well as counter-references, and direct  
131 quotes from the interviewees in order to enrich the argument. Finally, the main contributions of the  
132 research, its managerial implications, and the future lines or research are drawn in the Conclusions  
133 section.

134

135

## 136 **LITERATURE BACKGROUND**

137

138 Subcontracting is defined as the outsourcing of the tasks that differ the most from the main activity  
139 of the contractor; these tasks are awarded to other companies named subcontractors, which supply  
140 materials, equipment and manpower (González-Díaz et al. 2000; Yik and Lai 2008; Ng et al. 2009;  
141 Tam et al. 2011). The supply chain has several tiers (or layers) of outsourcing: companies that work  
142 directly for the main contractor (top-tier), and companies that work for the former (low-tier or sub-  
143 subcontractors); there may be additional tiers of sub-subcontractors until reaching the lowest tier of  
144 self-employed workers (Yik and Lai 2008). Thus, the supply chain becomes a multi-tier  
145 subcontracting system (Choudry et al. 2012).

146

147 Because of the uneven demand of the construction sector (Winch 1998; Tam et al. 2011),  
148 subcontracting allows the main contractor to transfer the risk to the subcontractor, in cascade  
149 subsequently in the supply chain (Beardsworth et al. 1988; Hsieh 1997; Ng et al. 2009; Choudry et al.  
150 2012). This transfer of risk takes into consideration the workload pressures and resources  
151 constraints, as well as financial profits (Beardsworth et al. 1988; Ng et al. 2009). The main contractor  
152 avoids hiring all the planned resources (workforce, plant, equipment) to carry out the project  
153 awarded (Choudry et al. 2012). The main contractor (and top-tier subcontractors, too) reduce their  
154 overhead costs and retain fewer full-time workers. Other risks, such as errors in estimating or

155 additional payments to the workforce (over time or insurance), are also transferred to the  
156 subcontractor (Loh and Ofori 2000).

157

158 Division of labor increases operative efficiency of the construction project, adding as many tiers of  
159 subcontracting as required by the magnitude and difficulty of the project (Elazouni and Metwally  
160 2000; Arditi and Chotibhongs 2005; Tam et al. 2011). Given the specialization and experience  
161 provided by subcontractors (Hinze and Tracey 1994; Choudry et al. 2012), subcontracting also  
162 introduces the main contractor to other geographical markets, increasing the efficiency in projects  
163 by using local subcontractors (González-Díaz et al. 2000). Overall, subcontracting increases flexibility,  
164 making the whole supply chain system more resilient (Winch 1998; Yik and Lai 2008; Zou and Lim  
165 2006).

166

167 There are, however, a series of problems created with subcontracting. Low-tier subcontractors use  
168 cheaper labor, equipment and materials (Low and Sua 2000; Tam et al. 2011); this means poor  
169 business practices and performance (Schaufelberger 2003; Yik and Lai 2008; Ng et al. 2009; Tam et  
170 al. 2011) and a final product of low quality (Elazouni and Metwally 2000; Tam et al. 2011; Choudry et  
171 al. 2012). Some authors blame this bad performance on the conflicts and risks that are pushed down  
172 the hierarchy from the main contractor to subcontractors, leading to antagonistic and contentious  
173 relationships (Hinze and Tracey 1994; Kumaraswamy and Matthews 2000; Eom et al. 2008).

174

175 The growing number of firms involved in the process makes communication throughout the supply  
176 chain particularly inefficient (Yik and Lai 2008; Choudry et al. 2012). Thus, there is an additional need  
177 to coordinate and control (Elazouni and Metwally 2000; Tam et al. 2000) in order to somehow  
178 neutralize the reduction of overhead costs mentioned earlier. By accepting risk from the main  
179 contractors, the subcontractors are more vulnerable to market fluctuation, especially the low-tier  
180 firms (Schaufelberger 2003; Ng et al. 2009; Yik and Lai 2008). In many countries, there is no specific



181 regulation on subcontracting in general, nor is there a legal framework for formal contracts between  
182 the different companies in the supply chain (Yik and Lai 2008; Choudry et al. 2012). All this hinders  
183 the accountability among the parties when problems appear (Hinze and Tracey 1994; Choudry et al.  
184 2012).

185

186 Subcontracting is a worldwide practice in the construction industry. Specific reports have been  
187 published about subcontracting in countries such as the United States (Hinze and Tracey 1994; Arditi  
188 and Chotibhongs 2005), Hong Kong (Yik and Lai 2008; Ng et al. 2009; Tam et al. 2011), Taiwan (Hsieh  
189 1998), the United Kingdom (Winch 1998; Briscoe and Dainty 2005), Pakistan (Choudry et al. 2012),  
190 Japan (Reeves 2002), Brazil (Oviedo-Haito 2010), Australia (Zou and Lim 2006), or Spain (González-  
191 Díaz 2000), to cite a few. In spite of being a universal *modus operandi*, subcontracting depends on  
192 the construction culture and specific regulations of each country.

193

194

## 195 **RESEARCH METHOD**

196

197 The grounded theory method (Glaser 1978 and 2002; Charmaz 2006) was chosen for this study,  
198 which aims to find out the factors facilitating the survival of subcontractors in a scenario of severe  
199 economic crisis. The research explained in this paper does not require developing a theory;  
200 nevertheless, the concept-indicator model (Glaser 1978) was used to systematically collect, codify  
201 and compare the emerging categories found. This research is exploratory in its nature. The data was  
202 collected through in-depth open-ended interviews (Woodside 2010).

203

204 The sample criteria to select the interviewees were established in the following way. In a previous  
205 research developed by one of the authors regarding the implementation of project management  
206 practices by Spanish contractors (Sutrisna et al. 2012), 12 contractors were investigated; this sample

207 included three large companies (with annual turnover above 2.5 billion Euros) and nine medium  
208 companies (with annual turnover between 75 and 400 million Euros). The interviewees (senior  
209 managers and heads of departments from these main contractors) had to provide a short-list of  
210 reliable subcontractors per sub-fields. Out of a list of more than 50 subcontractors, 12 of them were  
211 chosen considering their preference among the main contractors and their accessibility (the  
212 subcontractors had to agree to participate in the research).

213

214 Another target was to cover all the main sub-fields or trades within a construction project in order to  
215 guarantee a minimum homogeneity among participants. Every firm analyzed included labor among  
216 its outsourced resources, and had a minimum annual turnover of two million Euros and ten full-time  
217 workers. Furthermore, the interviewees are senior managers of subcontracting companies with a  
218 minimum of ten years of experience.

219

220 The sample size was obtained by theoretical saturation (Glaser 1978 and 2002; Charmaz 2006).  
221 According to Guest et al. (2009), if there is homogeneity in the sample, saturation is achieved  
222 between the eighth and twelfth interview. In this research, it was attained after the eighth interview  
223 too. Four additional interviews were conducted as means of confirmation, but they brought very  
224 little new information to the aggregate findings. The 12 interviewees and their corresponding  
225 companies are described in Table 1. The companies are classified according to the service offered,  
226 experience, workforce, turnover, and size; the size of the company is obtained according to the  
227 business turnover of the company only (European Commission 2003), as follows (see Table 1): (S)  
228 less than 10 million Euros; (M) between 10 and 50 million Euros; and (G) over 50 million Euros.

229

230 The data were collected with a protocol that used relevant questions to be followed during the  
231 interview. It also complied with the usual characteristics of long interviews, as described by  
232 Woodside (2010). This guided questionnaire had two main parts: one characterizing the company

233 and the interviewee (Table 1), and the other describing the value chain and its interaction with the  
234 environment. Given the exploratory approach of the study, deviation from the issue at hand was  
235 allowed by the interviewer when other topics of interest were raised by the interviewees. In this  
236 new scenario of economic downturn, it was especially important to determine: (a) if the firm had to  
237 adapt somehow in order to survive; and (b) what issues were more relevant for the survival of the  
238 firm. Knowledge acquired this way was brought up in subsequent interviews to determine if it was  
239 just an individual opinion or one of general consensus. The whole procedure took around three  
240 hours per interviewee. The collected data was transcribed, read again, and organized. After a second  
241 reading, it was subjected to coding procedures. A final reading led to writing the memos; these  
242 memos take the researcher from data to conceptualization, determining the core categories  
243 (Charmaz 2006). These categories were constantly compared with data coming from new interviews,  
244 as well as from the literature review, using triangulation until saturation (Charmaz 2006). This  
245 protocol allowed core categories to emerge and explain theoretically how the phenomenon under  
246 study works (Glaser 2002; Charmaz 2006).

247

248 <TABLE 1 HERE>

249

250

## 251 **RESULTS AND DISCUSSION**

252

253 Even though the final aim of the research process was to identify the core categories, their  
254 explanation and justification followed a reverse logic. First, the core categories obtained as a final  
255 output of the research were stated, and later they were justified and analyzed thoroughly. From the  
256 interviews, many indicators were identified and they were coded as 34 factors or subcategories;  
257 they were grouped into eight final categories: financial capital, legal framework, demand, geographic

258 scope, project delivery system, managerial assets, human assets, and relationship assets. Table 2  
259 describes the set of 34 subcontractor survival factors for each one of these core categories.

260

261 <TABLE 2 HERE>

262

263 As stated in the previous section, it was important to determine the factors that were especially  
264 relevant for the survival of the firm in an economic downturn. Table 2 highlights in bold those factors  
265 that facilitate the survival of subcontractors in a scenario of severe economic crisis from those  
266 factors that allow the survival or success of a subcontractor in any stage of the economic cycle  
267 (sometimes simply making more profit). Nine out of 34 factors, representing five out of eight core  
268 categories, are specifically relevant in economic downturns. The other 25 factors can be considered  
269 valid for any economic situation. Several authors (Schleifer 1990; Hall 1994; Arditi et al. 2000; Lim et  
270 al. 2010) have already considered some of these general factors for contractors. Their contributions  
271 are taken into consideration later in the discussion in order to: (a) differentiate between general and  
272 specific factors; and (b) support (or not) the opinions of the interviewees.

273

274 The survival factors obtained through this research are explained, analyzed and justified, per group  
275 of categories, in the following sub-sections. References supporting these factors, as well as some  
276 counter-references, are also included in the discussion. Furthermore, comments from the  
277 interviewees (verbatim) enrich the argument; each quotation is referred to the corresponding  
278 interviewee in parentheses according to Table 1. The process of analysis and comparison of direct  
279 quotes and references supporting evidence lead to the final factors listed in Table 2.

280

281 ***Financial Capital***

282

283 During the expansion phase of an economic cycle, subcontractors are driven by each contract's  
284 profitability measured as profit from sales (Ng et al. 2009). However, in the current crisis  
285 environment, mistrust increases along with the risks, producing shortages and higher costs of  
286 interest, thus hampering subcontractors' access to credits and affecting their profit margin directly  
287 (Wood and Ellis 2005). Crisis scenarios also favor opportunistic behaviors in agents of the  
288 construction industry, mostly in general contractors (Arditi and Chotibhongs 2005). For their own  
289 profit, they impose conditions with their bargaining power, encouraging market malpractices, e.g.  
290 contractors finance the project based on deferred payments to subcontractors (Mason 2010):  
291 "Banks, in their distrust, do not lend us money to finance our operation as subcontractors; we have  
292 waiting periods as long as 270 days to receive progress payments from our clients" (E8).

293

294 Having credit becomes a key factor from the moment that subcontractors must pay for materials in  
295 advance, equipment and manpower sent to the building site (Schleifer 1990; Ng et al. 2009). Their  
296 recovery period is much longer than their payment period, especially since the workers' wages are  
297 paid within 30 days (Arditi et al. 2000). By assuming the additional financial cost, subcontractors  
298 need additional financial support (Arditi and Chotibhongs 2005). The problem is more serious when  
299 banks restrict their credit policies.

300

301 While in good times subcontractors could afford to increase prices with additional financial costs  
302 (Arditi and Chotibhongs 2005), nowadays the insolvency of contractors and banks' loss of confidence  
303 has made subcontractors' situations far more critical (Yik and Lai 2008): "I am not a bank and I have  
304 no ability to finance the work of my clients" (E2). Now it is essential for subcontractors to make a  
305 preliminary selection of clients, and carefully analyze the payment method (Ng et al. 2009).  
306 Specifically, they try to avoid being paid by promissory notes because if the subcontractor deducts  
307 them and in the end the client does not pay, the bank will charge the amount due plus interest to  
308 the subcontractor (Arditi and Chotibhongs 2005).

309

310 Companies that were more aware of the financial risk, or those that were able to change the focus in  
311 time, have managed to stay successful in this new scenario (Schleifer 1990): "For me the priority has  
312 always been to get paid; otherwise, I cannot pay my workers' wages" (E6). In these conditions, it is  
313 essential "to be financially sound to work" (E4). Any dysfunction in the capital market may be  
314 amplified and subcontractors feel it deeply (Chiang 2009): "Banks have closed the credit tap; there is  
315 lack of cash flow in financial markets" (E6). The problem is that banks lack the confidence to lend to  
316 any business related to the construction sector, even for those subcontractors who have always met  
317 their financial obligations; that were not the case during the expansion phase (Arditi et al 2000).

318

319 Shortly before the start of the crisis, hardly anyone cared about the payment method and most only  
320 negotiated the maturity of the payment document (Ng et al. 2009). The situation has changed  
321 dramatically: "I only accept contracts if I'm paid with confirmation or endorsement; if not, I have to  
322 assume too much risk" (E11). More and more subcontractors are now under a debt renegotiation  
323 process with their clients, and many of them were quick to point out: "The possibilities of us getting  
324 paid are minimal; we have given up on that money, or at least the majority of it" (E10). Another  
325 interviewee stated that "at this moment, we cannot increase investment in new machinery and  
326 equipment" (E8).

327

### 328 ***Legal Framework***

329

330 The existence of a well-established and consolidated legal framework forces subcontractors to  
331 continuously improve (Sese et al. 2002). Since the approval of Spanish Law 31/1995 on Occupational  
332 Risk Prevention, safety conditions on building sites have also significantly gotten better (Rubio et al.  
333 2008). This has been an opportunity for many companies which once bet on this strategy. This  
334 makes it easier for them to compete in their home market, and also when they decide to go abroad.

335 There is widespread agreement among the interviewees that legal compliance has helped them  
336 enhance their businesses: "The law on subcontracting has helped remove many commission agents  
337 that were not really companies at all" (E2). However, other authors (Tam et al. 2011) indicate that  
338 this increasing compliance with the law is not a general rule worldwide.

339

340 The existence of sector agreements that ensure guarantees for workers in the construction sector  
341 has had not only a severe impact on wages, but it has also brought improvements in risk prevention  
342 and training: "We cannot have unskilled laborers working at sites except to do very basic and low-  
343 risk tasks" (E1 and E12). In this scenario, companies prefer to train these workers so they can  
344 perform as skilled workers.

345

346 However, there are still shady aspects that the legal framework has failed to change, despite the  
347 various regulations issued. The main one is the regulation of payment to subcontractors, with the  
348 late payments as the most relevant example. Even though the deadline for payments is established  
349 in 60 days, "typically, you're offered payments delays between 180 and 210 days; the problem is  
350 that if I don't accept these conditions, there are many other companies that are willing to do so" (E3  
351 and E8). In any event, general contractors claim that public agencies do not meet their payment  
352 obligations either.

353

#### 354 ***Demand***

355

356 In a crisis scenario, there is a clear downward pressure on costs from the demand side. The  
357 downstroke of prices is not sustainable in the long run: "To apply a discount is an option that can be  
358 taken very easily" (E8). This can lead more professionalized companies into a difficult situation if  
359 they are continuously selling below cost (Schleifer 1990; Arditi et al. 2000; Lim et al. 2010),

360 consciously or unconsciously: "Clients always want the cheapest" (E5). This stereotype must be  
361 broken for the mutual interest of all parties.

362

363 This question is particularly critical for bidders with less differentiation in their trade (Dainty et al.  
364 2001): "Our clients are not willing to pay more for the differences in our bids" (E6). It is therefore  
365 necessary to continue looking for distinguishing characteristics which are valuable for the client even  
366 in a crisis scenario; characteristics which were differential five years ago are no longer. Once this  
367 problem is detected, subcontractors must find a way to escape this spiral which is very dangerous  
368 for firms: "We are trying to make new valuable proposals to access the market segments that had  
369 not been reached previously" (E5).

370

371 At the peak of the crisis, all the interviewed subcontractors met the requirements of the market.  
372 Even some subcontractors consider that being hired through price bids is positive: "It forces us to  
373 keep up and pay attention to changes in the market and our competitors" (E10). Thus, it seems  
374 much more productive to have a proactive attitude to changes in demand: "We are now recruiting  
375 through fixed-term work contracts to cover peak demand for labor" (E10). This challenges the typical  
376 defeatist attitude that eventually leads to the failure of the company: "There is much uncertainty,  
377 poor and very poorly paid work" (E9).

378

379 Another of the most common inefficiencies arising on the demand side is that contractors work  
380 throughout the whole process regardless of all the interference between the activities carried out by  
381 different subcontractors. Those tasks left in no man's land finally generate unforeseen cost overruns  
382 for the contractor. The subcontractor makes a profit in the short-term out of these "unexpected  
383 events". But the successful subcontractor that establishes long-term relationships with clients is the  
384 one who can warn the contractor of future problems and, at the same time, include these



385 contingencies in the bid. These gaps between different tasks affect not just the construction phase,  
386 but also the design phase and then have implications in the operational phase of the project as well.

387

### 388 ***Geographic Scope***

389

390 Subcontractors that are performing best during the crisis scenario have also adapted their  
391 geographical scope. The most pronounced trend is internationalization. In general, all stakeholders  
392 in the production chain (developers, construction companies, engineers, subcontractors and  
393 suppliers) have considered extending their scope (Martin and Gonzalez 2010). Local companies have  
394 broadened their scope to the whole country and the larger ones have become international  
395 (Schleifer 1990; Jung et al. 2010 and 2012), the difference being the period cycle in which companies  
396 have taken this decision. It is not the same to become international as a long-term strategy (during  
397 the expansion phase of the cycle, mainly) than it is to work based on short-term need (economic  
398 contraction cycle).

399

400 A very particular behavior pattern in subcontractors is to go abroad with the help of a compatriot  
401 contractor (Arditi et al. 2000); this way, subcontractors try to spread their risks on a larger portfolio  
402 of projects to limit the risks associated with country-specific issues (Jung et al. 2010): "We are well-  
403 known in Spain and so they trust us abroad" (E7). Those who have not yet taken the step of  
404 internationalization are conscious that this is the best way: "I am currently making international bids  
405 for my best customer" (E11). However if the proposal to go abroad comes from unknown  
406 companies, the response is different: "I have had proposals to work abroad, but they did not seem  
407 reliable enough" (E3). Jung et al. (2010) also found that this pattern is not usually successful and  
408 other authors considered that expansion beyond the capabilities of the firm might be unwise  
409 (Schleifer 1990; Arditi et al. 2000; Lim et al. 2010). The decision to internationalize is even more

410 complex if the subcontractor's activity requires substantial investment in equipment: "I will only  
411 invest abroad if I have secured contracts with a client I know well" (E6).

412

### 413 ***Project Delivery Method***

414

415 Contractors tend to make the final decision to award a contract primarily based on the bid price  
416 (Arditi et al. 2000; Kumaraswamy and Matthews 2000). They are not willing to pay a higher price for  
417 the higher quality that subcontractors often wield in their sales pitches (Tam et al. 2011). However,  
418 the key factor for many successful subcontractors is that they are able to offer extras that add value  
419 and that the contractor can transfer to his client, generating a win-win scenario (Eom et al. 2008).  
420 Ultimately, this helps to improve the contractual relationship between them.

421

422 The main contractor's bargaining power can also be applied to transfer the risks the company takes  
423 in its contract with its client through clauses in the subcontracts (Dainty et al. 2001); hence, the  
424 subcontractor can do little to minimize the risks transferred to him. The contractual relationship  
425 between contractor and subcontractor is always subject to the lack of bargaining power of the latter  
426 towards his client (Hinze and Tracey 1994; Chiang 2009). This is exacerbated when similar bids can  
427 be found between different subcontractors (Reeves 2002). The key to differentiation and to gain a  
428 better bargaining position lies in the subcontractor's ability to differentiate his product by adding a  
429 good dose of services to facilitate his client's work (Gonzalez-Diaz et al. 2000; Dainty et al. 2001). Ng  
430 et al. (2009) claimed that managerial skills of subcontractors influence the awarding decision of the  
431 main contractor; however, the findings of this research do not support this claim. Further, in a crisis  
432 scenario it is more difficult to overcome the lack of bargaining power, and the contractor reinforces  
433 his position bringing prices down (Hinze and Tracey 1994; Arditi and Chotibongs 2005): "They take  
434 advantage of the situation asking us for contractual guarantees of about 5% of the contract, and

435 they hold them longer than they should" (E11). In this scenario, bid-shopping is very frequently the  
436 norm (Hinze and Tracey 1994; Arditi and Chotibhongs 2005).

437

438 When the infrastructure life cycle follows the separate stages of the traditional design–bid–build  
439 sequence, usually integration problems appear in the project too. This is because the knowledge of  
440 previous stages is not incorporated in the later ones, causing uncertainties in the final product and  
441 inefficiencies in the execution (Kumaraswamy and Matthews 2000; Dainty et al. 2001). All this leads  
442 to poorly defined projects (Arditi et al. 2000); therefore, the ability of some subcontractors to work  
443 hand-in-hand with their clients to solve these problems with mutual benefit, is a competitive  
444 advantage (Ng et al. 2009). For other subcontractors, their lack of design skills is a source of conflict  
445 with the main contractor. It is not simply a question of transferring risks to the subcontractor,  
446 copying the clauses that bind the contractor with the owner: it is about considering the  
447 subcontractor as a collaborator (Dainty et al. 2001).

448

449 Major contractors often ask for several versions of bids, extending the selection period of  
450 subcontractors. The problem is to the contractor's disadvantage: "When you are awarded the  
451 contract, you have to start the very next day and you always begin with a delay" (E3). The ability to  
452 react quickly is not common to all subcontractors, yet it is highly valued by their clients  
453 (Kumaraswamy and Matthews 2000; Dainty et al. 2001). The lack of agreement on the start date  
454 frequently spreads to the whole works schedule. Therefore, the scheduling of the project is not  
455 usually negotiated, but rather imposed by the contractor; the subcontractor simply complies with it  
456 without any possibility of adapting it at his discretion (Eom et al. 2008).

457

458 ***Managerial Assets***

459

460 Subcontractors do not usually follow a systematic management process at their construction sites.  
461 For example, among the interviewed companies, only one is certified in processes (ISO 9001, ISO  
462 14001 and OSHAS 18001), whereas five are only certified in product quality; the rest of them do not  
463 have any certification of this kind. Furthermore, all the subcontractors stated that flexibility is one of  
464 their main competitive advantages in business management: "We have the flexibility to revert our  
465 organization to the 2007 scenario very quickly, even tomorrow" (E10). Such statements are possible  
466 because subcontractors are small businesses with an organization completely centralized in the  
467 owner or CEO (Arditi et al. 2000).

468

469 In this case, the entire management process of the company is determined by the personality of the  
470 founder, rather than by training, which is rarely college level (Schaufelberger, 2003). In these  
471 companies, the first step towards professionalizing management is taken in finance and accounting:  
472 "Our priority is to bring an analytical accounting system that would allow us to obtain economic data  
473 contract by contract" (E2). In fact, before taking this step, subcontractors usually outsource financial  
474 management and accounting services through small financial and economic consulting firms. As  
475 subcontractors are progressing professionally, they require more and more information and  
476 communication tools (Hall 1994), as well as administrative software (Schleifer 1990). However, only  
477 large subcontracting companies use Enterprise Resource Planning packages.

478

### 479 ***Human Assets***

480

481 Human assets are undoubtedly of major importance for businesses nowadays. It has even become  
482 an advertising slogan for many companies, by dint of being repeated by human resources and  
483 marketing departments. But subcontractor companies are labor intensive, focusing on manual work,  
484 and they require skills that are acquired almost exclusively from practice (Ng et al. 2009); in this  
485 scenario, human assets are critical (Hall 1994; Eom et al. 2008). The subcontractor's site manager is a

486 key agent who assures the progress of the works, as well as the subcontractor's profit.  
487 Subcontractors have a great capacity to adapt to the characteristics of each contract, being very  
488 flexible when expanding or reducing their workforce. In many cases, the subcontractor' site manager  
489 assumes as well the role of a supervisor or foreman for the main contractor (Hinze and Tracey 1994).

490

491 During the current recession there have been two different stages in regard to workers dismissal. In  
492 the first stages companies got rid of surplus and less trained personnel (Lim et al. 2010): "The only  
493 good thing about the crisis is that the less productive workers are no longer in the company" (E2);  
494 another interviewee said that "workers now work only according to their skills, and if they are  
495 unskilled they are unemployed" (E7). In the second stage the dismissals affect key personnel of the  
496 organization, jeopardizing the competitiveness of the company (Schleifer 1990): "Now is a time  
497 when we are taking up early retirements for more experience manpower" (E3). Interviewees agree  
498 that companies are struggling to keep construction managers and foremen on staff, especially those  
499 who have better knowledge of the activity: "We seek contracts just to keep our best workers" (E5).

500

501 This surplus of professionals in the market means lower labor costs, and companies that have  
502 adjusted their staff do not have any problems to meet peak demand: "Now manpower is not a  
503 problem, there is a greater deal of unemployment and you can find workers immediately" (E12).  
504 Although the paradox is that there are workers who prefer staying unemployed rather than working  
505 for a month: "They find it more profitable to collect the unemployment subsidy from the  
506 Government than to stop receiving it to work occasionally" (E9).

507

508 All the interviewees recognized the importance of skills and the loyalty of the workforce and the  
509 technical staff (Hall 1994; Ng et al. 2009): "All our workers, in addition to experience, have studied  
510 and they keep on doing so today" (E12). However, not every company solves its training needs in the  
511 same way. Larger companies have training departments with annual budgets to train all levels of

512 staff, from laborers to senior management: "We take all available grants, and also invest equity in  
513 training" (E1). In contrast to the dominant model that focuses on internal training (Choudry et al.  
514 2012), there are others who prefer to recruit experienced professionals, who work independently  
515 right away: "With current market prices, I cannot spend money on training a worker" (E11).

516

517 On certain occasions, during the expansive economic cycle, companies were faced with the opposite  
518 scenario. There was a great lack of personnel with suitable training and experience. Thus,  
519 contractors, unable to recruit or retain their managers or supervisors, had to rely on the  
520 subcontractors' foremen and supervisors to perform this role. This has been useful for many  
521 subcontractors who have known their clients "from the inside" and taken advantage of it during the  
522 crisis.

523

524 It is still common to find on-site supervisors or foremen with substantial experience but little formal  
525 training. However, there seems to be a trend to increasingly appreciate formal training. The  
526 increasing specialization of work, depending on the job category of each worker, is leading to a  
527 growing demand for training and a greater appreciation of it.

528

529 Despite the acknowledged ability of subcontractors to accommodate peak demand in contracts, as  
530 they have a flexible workforce, more professionalized subcontractors have in recent years bet on  
531 mechanization (Ng et al. 2009). This trend has been most pronounced in jobs that require more  
532 physical exertion, by introducing more elevation and transport machinery at building sites.  
533 Investment in equipment by certain subcontractors has improved competitiveness as wage costs of  
534 direct labor have increased (Chiang 2009).

535

536 But the most remarkable aspect in regard to human assets is that the more qualified personnel, once  
537 aware of the current situation, begin looking for their own niche in the labor market, either in other

538 sectors or in other countries. This is causing an accelerated drain of skilled and knowledge-intensive  
539 personnel in the construction industry. Employees who were emigrants employed in the industry are  
540 now returning to their home countries because they are finding better conditions there: "Others are  
541 going on an adventure to countries where they have relatives or simply acquaintances that can offer  
542 them a job" (E7).

543

#### 544 ***Relationship Assets***

545

546 A subcontractor's corporate image, the relationships of trust established in the sector  
547 (Kumaraswamy and Matthews 2000; Kale and Arditi 2001), and the existence of previous links with  
548 the main contractor are key issues to obtain new contracts (Yik and Lai 2008; Ng et al. 2009; Zou and  
549 Lim 2006). This partially contradicts the main factor highlighted in the project-delivery-method  
550 category: that price is the decisive factor when awarding a subcontract (Lim et al. 2010). So, these  
551 "trusting relationships" could be considered as a prerequisite to qualify and bid for contracts.

552

553 The ability of subcontractors to keep up-to-date through their professional network is yet another  
554 key factor underlying their success. These relational ties are maintained both in the informal and  
555 formal sphere (associations, industry groups, professional lobbies, etc.). Most subcontractors believe  
556 that time and resources invested in fostering these relationships are profitable, even though it may  
557 be intangible. Lobbying is crucial for main contractors since they obtain some political influence or  
558 even legal support to appeal public tenders maintaining anonymity; however, subcontractors seek  
559 other objectives in lobbying, mainly related to the provision of services which are more expensive  
560 than when accessing individually: "Our professional association helps us to keep our staff updated  
561 about technical regulations" (E9). Overall satisfaction by members in associations is high: "It works  
562 very well and also keeps us up-to-date on the new products coming to the market" (E10).

563

564 When it comes to updating collective agreements for workers, lobbies are also useful to improve  
565 bargaining power, especially against the unions. Lobbies usually provide other value-added services,  
566 with different degrees of acceptance among its members: "They also have an alert service for  
567 tender, but for us it is of little use, since we have a better service supplied by an outside company"  
568 (E1). Again, the link between trade unions and subcontractors arises, as it does in the previous  
569 discussion on legal framework.

570

571 Although subcontractors seldom form joint ventures, they benefit from the main contractor's joint-  
572 ventures (Arditi et al. 2000). Normally it is one of the members of the consortium who proposes a  
573 particular subcontractor to do certain work. Working for the joint venture is an excellent opportunity  
574 for the other contractors to know first-hand the capabilities of the subcontractor, and thus, the  
575 subcontractor makes a valuable commercial work to attract a new client while fulfilling their  
576 contract.

577

578

## 579 **CONCLUSIONS**

580

### 581 ***Main Contributions of the Research***

582

583 This paper analyzes the issues that subcontractors face in an economic crisis scenario and identifies  
584 the factors that are critical for their survival, differentiating those coming from an economic  
585 downturn from those that can be found in any stage of the economic cycle. While the contributions  
586 of this paper are focused specifically on the crisis scenario, the whole set of factors should be  
587 considered in any economic scenario.

588



589 Subcontractors' need for financial soundness increases during periods of economic crisis. The project  
590 deliver method used by the owner and also by the main contractor is mainly based on price;  
591 therefore the subcontractors' bids keep getting lower being unprofitable and unsustainable in the  
592 long run. In this particular crisis this fact is exacerbated by the difficulty of getting financial support  
593 from the banks. Hence, it is essential for subcontractors to make a preliminary selection of clients,  
594 focusing on the payment guarantee and method.

595

596 Successful subcontractors establish long-term relationships with their clients warning them of the  
597 problems they might encounter in the construction process and, at the same time, including these  
598 contingencies in their bids. In spite of the trend to award contracts to the lowest bidder,  
599 subcontractors are able to offer value, generating a win-win deal with the general contractor.  
600 Ultimately, this helps to improve their contractual relationship.

601

602 Regarding the human assets, subcontractors tend to lay off workers according to their (inferior)  
603 training, experience, and productivity, not only the employee's cost of dismissal. This is due to the  
604 fact that a skilful and loyal core workforce and technical staff are basic for the survival of the firm.  
605 Moreover, the surplus of professionals in the construction market allows for a decrease in labor  
606 costs. However, qualified personnel, once aware of the current situation, look for their own niche in  
607 the labor market, either in other sectors or other countries.

608

609 The most successful subcontractors became internationalized during the expansion phase of the  
610 cycle, while many others have been forced to do so out of necessity. Furthermore, in an effort to  
611 limit risks, these subcontractors have often gone abroad thanks to one of their regular contractors in  
612 their home country.

613

614 ***Managerial Implications***

615

616 After several years of severe crisis in the construction sector, unprofessional and opportunistic  
617 subcontractors are out of the market. Therefore, most of the existing companies present at least  
618 some of the features described in this research. However, if they do not keep updating their survival  
619 is at risk. In order to guide companies, four key managerial implications are briefly explained next:  
620 financial soundness, relationships with main contractors, flexibility, and a lean hierarchical  
621 organization. In every crisis it is important for the companies to have liquidity; in this particular one,  
622 it is even more important because the banks do not lend money easily. Therefore, subcontractors  
623 should prioritize their financial health above anything else.

624

625 Flexibility is another competitive advantage for the best subcontractors. Subcontractors have to  
626 adapt quickly to new scenarios and, if possible, to plan ahead for them. This makes it easier for  
627 subcontractors to compete not only in their home market, but also abroad. Subcontractors that  
628 invest in their corporate image, build relationships of trust, and that make use of previous links with  
629 the main contractor, perform much better than others; these "trusting relationships" can be  
630 considered as a prerequisite to qualify and bid for the contracts. Finally, keeping a lean hierarchical  
631 organization with a core professional staff skilful and loyal to the company can help the  
632 subcontractors to achieve their goal too. The accomplishment of these three additional  
633 characteristics can help the subcontractors to attain financial soundness too and, therefore, increase  
634 their chance of survival.

635

### 636 ***Limitations and Future Research***

637

638 As a final point, the main limitation of this research is that the field work developed was exploratory  
639 and the sample chosen was purposive. Even though outcomes cannot be generalized, this research  
640 does give insight from top managers of successful Spanish subcontractors in a scenario of severe

641 economic crisis. The factors obtained in this research should be tested and refined in the future with  
642 a larger number of subcontractors, considering time and geographical aspects too. This way, three  
643 future research lines are currently open and underway. First, a broader survey of subcontractors  
644 would allow generalization to the Spanish scenario of economic crisis. Second, the evolution during  
645 the coming years of the twelve companies considered in this research, analyzed as case studies, is  
646 being monitored for a comparison between recession and boom periods. Finally, this research is  
647 being replicated in Brazil in order to compare subcontractors' behavior in an upward trend scenario  
648 with the downward scenario discussed in this paper.

649

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651

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657

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786

787



Interviewee	Main Activity	Company's Experience (Years)	No. Employees	Size	Interviewee's Position	Interviewee's Experience (Years)
E1	Maintenance of civil infrastructures and gardening	26	200	M	CEO	15
E2	Reinforced concrete foundations and structures	12	50	S	Partner	18
E3	Industrial painting	19	200	M	Partner	18
E4	Brickwork, masonry and general workforce	13	150	M	Site Manager	11
E5	Concrete forms	29	200	L	Marketing Director	23
E6	Reinforcement steel	26	120	M	CEO	15
E7	Equipment and machinery: general and transportation	10	1100	L	Marketing Director	16
E8	Equipment and machinery: cranes and special vehicles	23	45	S	Marketing Director	13
E9	Brickwork, masonry and general workforce	11	60	M	CEO	19
E10	Electric and electronic facilities and maintenance	15	10	S	CEO	24
E11	Earthwork	51	55	M	CEO	46
E12	Hydraulic systems	6	35	S	CEO	15

789 Table 1. Characterization of interviewees (data from December 31, 2012).

CATEGORY	FACTOR
<b>FINANCIAL CAPITAL</b>	<ul style="list-style-type: none"> <li>• <b>During the contraction phase of an economic cycle, subcontractors are driven by each client's guarantee of payment, overshadowing profitability</b></li> <li>• <b>During the contraction phase of an economic cycle, subcontractors ask for payments before beginning work</b></li> <li>• Subcontractors assume additional financial costs; they are paid later than the main contractor, and they have to provide a performance bond for the contract price</li> <li>• Because subcontractors assume additional financial costs, they require sound financial support and any change in the financial market affects them to a large extent</li> <li>• <b>It is difficult for subcontractors to mitigate the risk of the main contractor's default which may lead to a chain reaction causing the bankruptcy of the subcontractor too</b></li> </ul>
<b>LEGAL FRAMEWORK</b>	<ul style="list-style-type: none"> <li>• The legal framework affecting occupational health and safety and subcontracting sufficiently regulates the relations between the main contractor and its subcontractors</li> <li>• Health and safety regulations as well as trade union agreements are generally enforced by subcontractors</li> </ul>
<b>DEMAND</b>	<ul style="list-style-type: none"> <li>• <b>During the contraction phase of an economic cycle, competition is among the better and more specialized firms that survived the peak of the crisis</b></li> <li>• The contract can be broken down into work packages by the main contractor without realizing there are interferences among the different subcontracts</li> <li>• Subcontractors are rarely involved in the pre-construction phases or in the subsequent operation phase</li> </ul>
<b>GEOGRAPHIC SCOPE</b>	<ul style="list-style-type: none"> <li>• <b>During the contraction phase of an economic cycle, subcontractors look for contracts abroad</b></li> <li>• <b>Subcontractors look for contracts abroad only with the help of regular clients in their home country</b></li> </ul>
<b>PROJECT DELIVERY SYSTEM</b>	<ul style="list-style-type: none"> <li>• The final decision to award a subcontract is taken by the main contractor based essentially on the price bid</li> <li>• The main contractor is not willing to pay more for additional quality or reliability that may add value to the final product or service, unless these extras can be charged directly to the owner</li> <li>• The main contractor often transfers risks to the subcontractor through clauses in the contract</li> <li>• Subcontractors' bargaining position is weaker than that of the main contractor, unless the subcontractor executes highly specialized works</li> <li>• Subcontractors play a key role in improving projects that start construction with shortcomings and lack definition, cooperating with the main contractor</li> <li>• The scheduling of the project is not usually negotiated between main contractor and subcontractors</li> </ul>
<b>MANAGERIAL ASSETS</b>	<ul style="list-style-type: none"> <li>• Subcontractors do not usually follow a systematic management process in their construction sites</li> <li>• It is very common for the subcontracting company to be owned by a single shareholder who usually manages the company in a very personal way</li> <li>• The owner of the subcontracting company is both the CEO and the commercial director, depending on the success of the company and often on his public relations skills</li> <li>• Subcontractors often outsource administrative, accounting and financial matters to specialized management firms</li> <li>• The use of management software by subcontractors is limited to commercial applications (or slightly customized) for financial accounting</li> </ul>
<b>HUMAN ASSETS</b>	<ul style="list-style-type: none"> <li>• The subcontractor's site manager is a key agent for assuring the work progress, as well as the subcontractor's profit</li> <li>• Subcontractors have a great capacity to adapt to the characteristics of each contract, being very flexible expanding or reducing their workforce</li> <li>• <b>Subcontractors decide to dismiss workers based on training, experience, and productivity, not only the employee's cost of dismissal</b></li> <li>• The training of subcontractors' workers is based more on "learning by doing" than on formal training, the exception being health and safety regulations</li> <li>• In many cases, the subcontractor' site manager performs the additional role of a supervisor or foreman for the main contractor</li> <li>• Subcontractors have progressively incorporated more equipment to their part of the construction project, reducing direct labor as human resource costs increase</li> <li>• <b>Due to the long crisis, highly qualified human resources are looking for other kinds of work, in</b></li> </ul>

CATEGORY	FACTOR
	<b>other sectors, or in other countries, decapitalizing the construction industry</b>
RELATIONSHIP ASSETS	<ul style="list-style-type: none"> <li>• <b>The subcontractor's corporate image, relationships of trust, and previous links between the main contractor and the subcontractor are a prerequisite to tender a contract</b></li> <li>• Subcontractors are increasingly aware of the need to form lobbies to defend their interests as construction industry agents or looking for technical support</li> <li>• Subcontractors do not usually form joint ventures with other subcontractors to undertake greater volumes of work</li> <li>• When a joint venture between construction companies is created, the subcontractor proposed has an excellent opportunity to expand client portfolio for future contracts</li> </ul>
<b>Note: factors that are specifically relevant in economic downturns are highlighted in bold</b>	

Table 2. Subcontractor survival factors for core categories.